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The IAGOS Information System: From the aircraft measurements to the users.

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IAGOS (In-service Aircraft for a Global Observing System, http://www.iagos.org) aims at the provision of long-term, frequent, regular, accurate, and spatially resolved in-situ observations of atmospheric chemical composition throughout the troposphere and in the UTLS. It builds on almost 20 years of scientific and technological expertise gained in the research projects MOZAIC (Measurement of Ozone and Water Vapour on Airbus In-service Aircraft) and CARIBIC (Civil Aircraft for the Regular Investigation of the Atmosphere Based on an Instrument Container). The European consortium includes research centres, universities, national weather services, airline operators and aviation industry.

IAGOS consists of two complementary building blocks proving a unique global observation system: IAGOS-CORE deploys newly developed instrumentation for regular in-situ measurements of atmospheric chemical species both reactive and greenhouse gases (O_3, CO, NO_x, NO_y, H_2O, CO_2, CH4), aerosols and cloud particles. In IAGOS-CARIBIC a cargo container is deployed monthly as a flying laboratory aboard one aircraft.

Involved airlines ensure global operation of the network. Today, 5 aircraft are flying with the MOZAIC (3) or IAGOS-CORE (2) instrumentation namely 3 aircraft from Lufthansa, 1 from Air Namibia, and 1 from China Airlines Taiwan. A main improvement and new aspect of the IAGOS-CORE instrumentation compared to MOZAIC is to deliver the raw data in near real time (i.e. as soon as the aircraft lands data are transmitted). After a first and quick validation of the O_3 and CO measurements, preliminary data are made available in the central database for both the MACC project (Monitoring Atmospheric Composition and Climate) and scientific research groups. In addition to recorded measurements, the database also contains added-value products such as meteorological information (tropopause height, air mass backtrajectories) and lagrangian model outputs (FLEXPART). Data access is handled by open access policy based on the submission of research requests which are reviewed by the PIs. Users can access the data through the following web site: http://www.iagos.fr or http://www.pole-ether.fr as the IAGOS database is part of the French atmospheric chemistry data centre ETHER (CNES and CNRS).

The MOZAIC-IAGOS database contains today more than 35000 flights covering mostly the northern hemisphere mid-latitudes but with reduced representation of the Pacific region. The recently equipped China Airlines Taiwan aircraft started in July 2012 filling this gap. Future equipped aircraft scheduled in 2013 from Air France, Cathay Pacific and Iberia will cover the Asia-Oceania sector and Europe-South America transects. The database, as well as the research infrastructure itself are in continuous development and improvement. In the framework of the new starting IGAS project (IAGOS for GMES Atmospheric Service), major achievements will be reached such as metadata and formats standardisation in order to interoperate with international portals and other databases, QA/QC procedures and traceability, CARIBIC data integration within the central database, and the real-time data transmission.